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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PATHAK, SUDHANSHU C

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/910,971

Applicant(s)

VAIDYANATHAN,
KRISHNAMURTHY

Examiner

Sudhanshu C. Pathak

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on July 20th, 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6-8,13-15 and 20 is/are rejected.
- 7) ☒ Claim(s) 2-5,9-12 and 16-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on July 20th, 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-to-20 are pending in the application.

Drawings

2. The drawings (Fig.'s 6-10) are objected to because they are not legible i.e. the drawing are not clear so as to be able to understand what is disclosed.

Corrected (clearly legible) drawing sheets in compliance with 37 CFR

1.121(d) are required in reply to the Office action. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Figures 2C-to-Fig. 5 disclose a feedback filter element "211", however there is no output for the filter element described in the figures.

Specification

4. The Specification on Page 19, lines 16-17 referring to Fig. 2C describes "an input" as element "209", however the Figure does not disclose an element 209.
5. The Specification on Page 19, line 18-to-Page 20, lines 1-2 referring to Fig. 2C describes implementing a signal adder for adding the output of the forward filter to the outputs of the feedback filter and the intra-block time varying filters. However, Fig. 2C discloses the adding of the output of the forward filter to the outputs of the intra-block time varying filters. The

output of the feedback filter is not added to the above-mentioned quantities.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 6-8, 13-15 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berberidis et al. (6,052,702) in view of Xia et al. (6,829,297).

Regarding to Claims 1, 6-8, 13-15 & 20, Berberidis discloses a decision feed back equalizer for filtering a digital signal in a wireless communications system (Abstract, lines 1-2 & Column 1, lines 5-25). Berberidis also discloses the decision feedback equalizer comprises two temporal filters, a feed forward filter and a feedback filter wherein the feedforward filter receives received symbols as input and the feedback filter receives decisions as inputs (Abstract, lines 1-6 & Column 2, lines 35-67 & Fig. 's 1, 4, elements "FF", "FB", "DO"). Berberidis also discloses the equalizer further comprising a signal adder for combining filtered input samples from the forward filter and filtered output samples from the feedback filter to produce equalized output samples (Fig. 1, elements "+", "y(n)" & Fig. 4, elements 14, "y(n)" & Column 2, lines 50-65 & Column 4, lines 35-58 & Column 6, lines 15-31). Berberidis

Art Unit: 2634

further discloses implementing the equalizer on blocks of symbols blocks of decisions (Abstract, lines 6-9 & Column 2, lines 10-30 & Column 3, lines 45-55 & Fig. 4, elements "M", "L"). Berberidis also discloses implementing the DSP type computation device for determining the coefficients for the equalizer filters so as to adapt the response of the filters to the variants of the transmission channel (Column 7, lines 55-67 & Column 8, lines 1-20).

Berberidis discloses implementing an LMS algorithm for both the feedforward and feedback filters so as to minimize the error for each filter (Column 8, lines 22-65). However, Berberidis does not disclose a channel decoder for decoding the input signals.

Xia discloses a receiver comprising channel decoder for decoding the input signals and a block decision feedback equalizer within the channel decoder for channel equalization (Abstract, lines 1-11 & Fig. 1, elements 120-150 & Fig. 3 & Fig. 7 & Fig. 8 & Column 2, lines 55-65 & Column 3, lines 29-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Xia teaches a channel decoder for decoding the input signals and a block decision feedback equalizer within the channel decoder for channel equalization and this can be implemented as the equalizer so as to minimize the errors of the slicer as implemented in the feedback filter (equalizer) of the decision feedback equalizer so as to operate the receiver in an environment of low signal-to-noise ratio, thus satisfying the limitations of the claims.

Allowable Subject Matter

8. Claims 2-5, 9-12 & 16-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.
 - If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
 - The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2634

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak


STEPHEN CHIN
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